sonnet and associates,[4] of the three types of ICDs used, all weighed 240 g or more. This is much heavier than the ICDs of today. In fact, the lightest pacemaker (not ICD) they describe is about the average weight of today's ICDs. This in itself has reduced the amount of migration and extrusion seen over the years. Although previously advocated for use in all implants of ICDs, the use of the Parsonnet pouch has dwindled for the aforementioned reason, except in rare cases.[5]

The case described here is one of these rarities and has shown that extrusions can still occur in certain circumstances, even with new devices.

The availability of the Parsonnet pouch along with the cost means that these pouches are not kept routinely, even at major institutions or tertiary referral centers. Prolene mesh is readily available, particularly given its use in inguinal hernia repairs. In the procedure described herein, we fashioned a pouch out of a readily available material. This was an easier and cheaper solution than a specialist product. The described technique could also be applied to repeated migration of a pacemaker.

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Heart transplantation in situs inversus totalis

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Heart transplantation for situs inversus totalis is surgically challenging because it requires reconstruction of the mirror-image systemic venous pathways.

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CLINICAL SUMMARY

The patient presented is a 6-year-old boy in heart failure, weighing 17 kg, with situs inversus, dextrocardia, unbalanced atrioventricular canal, double-outlet right ventricle, mitral and pulmonary atresia, and bilateral superior vena cavae (SVCs). He had previous Blalock–Taussig and bidirectional Glenn shunts placed (Figure 1, *A*). Heart transplantation was performed as described in Figure 2, using a normal donor heart. The postoperative chest radiograph demonstrated dextrocardia of the transplanted heart (Figure 1, *B*).

DISCUSSION

The left atrium is a midline structure; the pulmonary artery, if developed, crosses the midline at some point; and

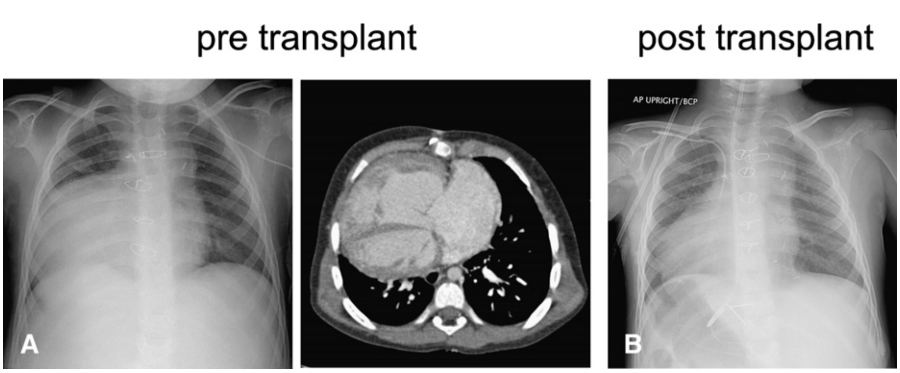

FIGURE 1. A, Pretransplantation imaging studies reveal situs inversus and dextrocardia. B, After heart transplantation, the normal donor heart remains in dextrocardia.

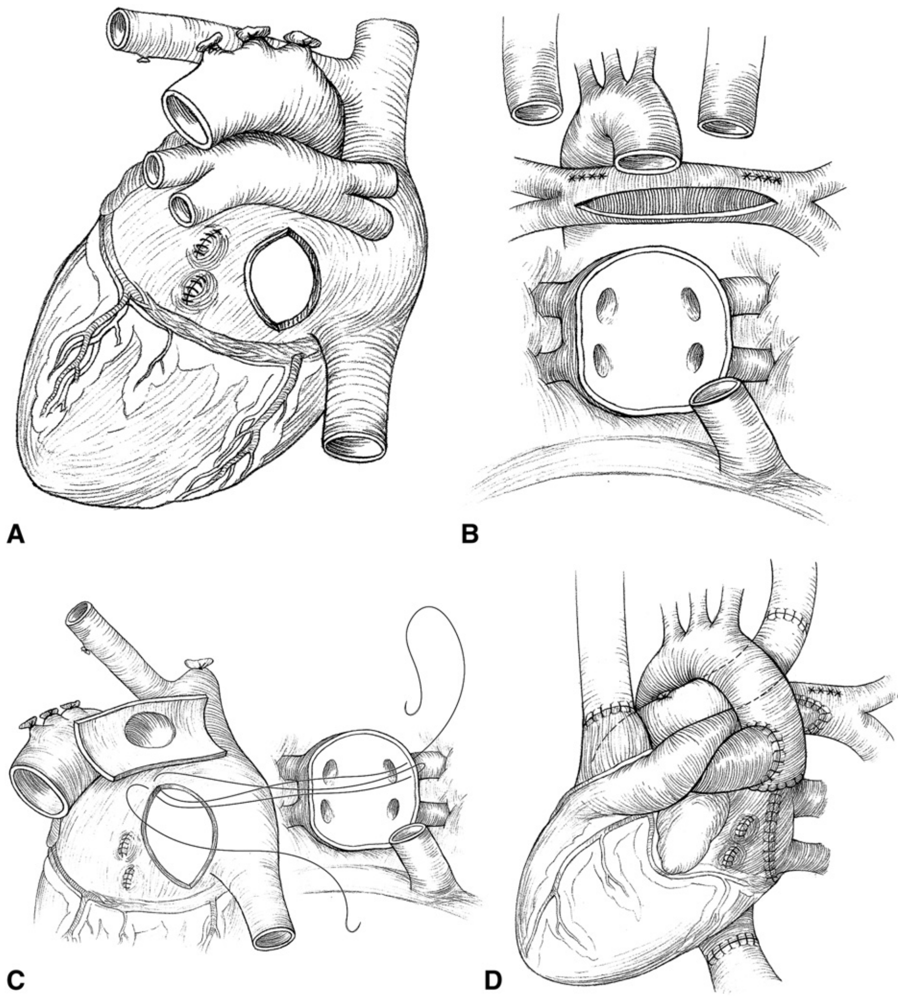

FIGURE 2. A, Donor cardiectomy was accomplished with en-bloc removal of the superior vene cava and innominate vein and extra length on the inferior vena cava, aorta, and pulmonary artery. The donor graft was then prepared by oversewing the left pulmonary vein orifices and opening the left atrium between the right pulmonary veins. B, Both recipient's superior vene cavae, the left-sided inferior vena cava, and the aorta were cannulated for cardiopulmonary bypass. Recipient cardiectomy was performed, leaving a standard pulmonary atrial cuff and a long cuff of systemic atrial tissue in continuity with the inferior vena cava. Both superior vene cavae were transected off the central pulmonary arteries. C, The pulmonary atrial anastomosis was performed first between the opening between the right pulmonary vein orifices on the donor side and the atrial cuff on the recipient side. The heart was rotated rightward about 45° along its long axis and approximately 30° in the frontal plane. D, The apex thereby rotated approximately 120° and to the right. The anastomosis between the donor and recipient inferior vena cavae was next. The conduit formed by the donor's superior vene cava and innominate vein was anastomosed to the left-sided recipient superior vene cava. A large patch of donor pulmonary artery was used to create a long anastomosis at the main pulmonary artery. Because of the rotation of the heart, the pulmonary artery was transposed to the right side of the aorta. The recipient aortic stump was oversewn, and an end-to-side aortic anastomosis was performed, resulting in mild bowing of the aorta over the underlying innominate vein. The recipient's right-sided superior vene cava was anastomosed directly to the right atrial appendage.

the aorta is usually anterior and to the right of the pulmonary artery, regardless of whether it originates normally or is transposed. Connections to a normal donor heart can usually be made without major difficulties. Intracardiac baffles[1] and extracardiac channels[2,3] for rerouting of the systemic venous return into the donor right atrium have been described. The implantation of the donor heart in a somewhat clockwise-rotated position has been proposed by the Loma Linda group,[4] although they suggested to widely excise the left pericardium to allow left-sided rotation of the graft.[5]

In this report we show that a normal donor heart can be seated in the recipient's pericardium in dextrocardia. This obviates the need for pericardial resection and avoids phrenic nerve injury and cardiac herniation. In previous cases using the Loma Linda technique, we found that the larger 3-lobed left lung can push the heart apex back under the sternum, causing right ventricular compression and tamponade physiology. In the presented technique the donor heart most effectively uses the existing space of the pericardial cavity. The rotation of the donor heart further helps to align the inferior vena cavae (IVCs) of the donor and recipient and allows a direct end-to-end anastomosis. Because of the natural course of the left SVC lateral to the aortic arch, an unhindered connection between the donor's innominate vein and the recipient's left SVC can usually be best ensured behind the ascending aorta. Obstruction of this conduit behind the aorta can be avoided by using extra tissue on the aorta, allowing for mild ascending aortic bowing. Although donor cardiectomy including the entire pulmonary artery trunk and extra length of the inferior vene cava is desirable, it is not an absolute necessity, and the use of other donor organs, such as lungs and liver, need not be restricted. We have used a segment of descending donor aorta to reconstruct the central pulmonary artery system in a case in which only the main pulmonary artery (PA) was available. Leaving a large cuff of systemic atrial tissue attached to the recipient's left-sided IVC further facilitates a connection free from tension, even if no extra length on the donor IVC is available.

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Techniques of inserting peritoneal dialysis catheters in neonates and infants undergoing open heart surgery

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Renal impairment in children undergoing open surgery is preferably managed by peritoneal dialysis. It is common practice to insert a peritoneal dialysis catheter (PDC) in neonates and infants at the end of open heart surgery.[1,2] One of the authors (G.N.) has been placing PDCs intraoperatively in neonates and infants since 1988 if a high possibility of hemodynamic instability or renal compromise is anticipated postoperatively. We describe the intraoperative techniques used by the authors.

CLINICAL SUMMARY

The 3 procedures, according to their final position, are (1) indirect transperitoneal (ITP), (2) direct transperitoneal (DTP), and (3) transdiaphragmatic (TD). The first 2 procedures consist of opening the peritoneum under the rectus sheath through extraperitoneal fat at the lower end of the sternotomy wound. The ITP technique (Figure 1, *A*) involves tunneling the PDC subcutaneously and bringing it out of the mediastinal wound and then passing it through the peritoneal opening in a suprahepatic position with a purse string around the opening.[3]

In the DTP procedure (Figure 1, *B*), an artery forceps is passed through the peritoneal opening made at the bottom of the surgical incision and brought out through the abdominal wall. The PDC is then retrieved with the artery forceps and placed in the abdominal cavity. The peritoneal opening is then closed.

In the TD procedure (Figure 1, *C* and Figure 2), the pericardium is incised vertically onto the diaphragmatic surface for 1 to 2 cm. At the apex of the incision, an opening is made into the peritoneum through the central tendon and a long length of the catheter is inserted (usually 25–30 cm of a 45-cm catheter) in the suprahepatic position. Then, the strong tissue of the central tendon and the diaphragmatic pericardium are sutured together with an absorbable suture 4-0 PDS II (Polydioxanone suture from Ethicon Inc, Somerville, NJ) forming an extraperitoneal tunnel. The PDC is then tunneled subcutaneously.

DISCUSSION

The ITP method has the advantage of minimizing hepatic or bowel injury by insertion of the catheter under direct vision and preventing omental herniation through the skin,

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